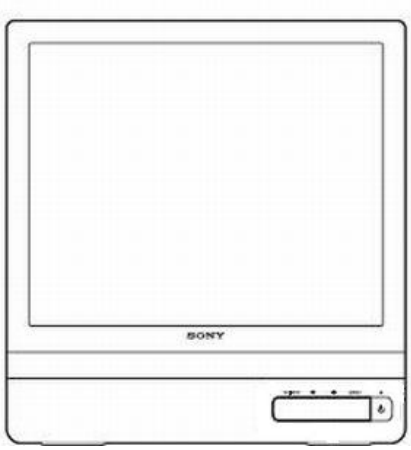
SDM-E76A: AEP, U/C, CH

SDM-E76D: AEP, U/C, CH, WB

SDM-E96A: AEP, U/C, CH

SDM-E96D: AEP, U/C, CH, WB

Service Manual



TFT LCD COLOR COMPUTER DISPLAY

SONY

CONTENTS

	Page
PRECAUTIONS	3
SPECIFICATIONS	4
TIMING CHART	5
SIGNAL CONNECTOR PIN	6
EDID data for SDM-E76x	7, 8
EDID data for SDM-E96x	9, 10
OPERATING INSTRUCTIONS	11
SERVICE MODE	12
WIRING DIAGRAM	13
DISASSEMBLY PROCESS	14, 15
ADJUSTMENT	16
SERIAL NUMBER LIST	17
EXPLODED VIEW	18
REPLACEMENT PARTS LIST	19, 20

PRECAUTION

WARNING FOR THE SAFETY-RELATED COMPONENT.

- There are some special components used in LCD monitor that are important for safety.
  These parts are marked on the schematic diagram and the replacement parts list.
  It is essential that these critical parts should be replaced with the manufacturer's specified parts to prevent electric shock, fire or other hazard.

- Do not modify original design without obtaining written permission from manufacturer or you will void the original parts and labor guarantee.

TAKE CARE DURING HANDLING THE LCD MODULE WITH BACKLIGHT UNIT.

- Must mount the module using mounting holes arranged in four corners.

- Do not press on the panel, edge of the frame strongly or electric shock as this will result in damage to the screen.

- Do not scratch or press on the panel with any sharp objects, such as pencil or pen as this may result in damage to the panel.

- Protect the module from the ESD as it may damage the electronic circuit (C-MOS).

- Make certain that treatment person's bodies are grounded through wrist band.

- Do not leave the module in high temperature and in areas of high humidity for a long time.

- The module not is exposed to the direct sunlight.

- Avoid contact with water as it may a short circuit within the module.

- If the surface of panel becomes dirty, please wipe it off with a soft material. (Cleaning with a dirty or rough cloth may damage the panel.)

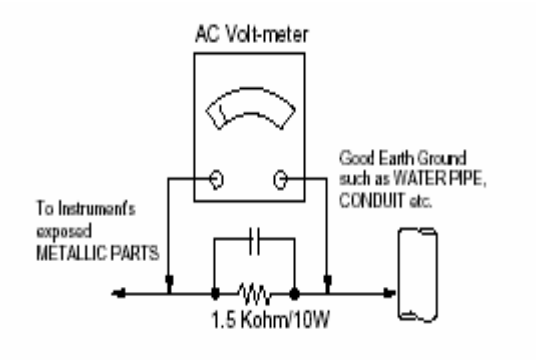
⚠ CAUTION
Please use only a plastic screwdriver to protect yourself from shock hazard during service operation.

⚠ WARNING
BE CAREFUL ELECTRIC SHOCK !

- If you want to replace with the new backlight (CCFL) or inverter circuit, must disconnect the AC adapter because high voltage appears at inverter circuit about 650Vrms.

- Handle with care wires or connectors of the inverter circuit. If the wires are pressed cause short and may burn or take fire.

Leakage Current Hot Check Circuit



SPECIFICATIONS

1. LCD CHARACTERISTICS

Type	: TFT Color LCD Module
Active Display Area	: 17 inch - **SDM-E76A/D**
	: 19 inch - **SDM-E96A/D**
Pixel Pitch	: 0.264 (H) x 0.264 (V) -**SDM-E76A/D**
	: 0.294 (H) x 0.294 (V) **-SDM-E96A/D**
Size	: 358.5(W) x 296.5(H) x 17.5(D) **- SDM-E76A/D**
	: 396(W) x 324(H) x 17.5(D) **- SDM-E96A/D**
Color Depth	: 16.2M colors - **SDM-E76A/D**
	: 16.2M colors **- SDM-E96A/D**
Electrical Interface	: LVDS
Surface Treatment	: Anti Glare, Hard-coating (3H)
Operating Mode	: Normally White
Backlight Unit	: Top/Bottom edge side 4-CCFL (Cold Cathode Fluorescent Lamp)

2. OPTICAL CHARACTERISTICS

2-1. Viewing Angle by Contrast Ratio $\geq$ 10

SDM-E76A/D

Left : 70°(Typ) Right : 70°(Typ)
Top : 70°(Typ) Bottom : 60°(Typ)

SDM-E96A/D

Left : -65° min., -70°(Typ) Right : +65° min., +70°(Typ)
Top :+70° min., +75°(Typ) Bottom : -55°min., -60°(Typ)

2-2. Luminance :

300(Typ) **- SDM-E76A/D**
300(Typ) **- SDM-E96A/D**

2-3. Contrast Ratio :

500:1 (Typ) **- SDM-E76A/D**
700:1 (Typ) **- SDM-E96A/D**

3. SIGNAL (Refer to the Timing Chart)

3-1. Sync Signal
Type : Separate Sync, Composite Sync, SOG (Sync On Green), Digital

3-2. Video Input Signal
1) Type: R, G, B Analog
2) Voltage Level: 0~0.71 V
a) Color 0, 0: 0 Vp-p
b) Color 7, 0: 0.467 Vp-p
c) Color 15, 0: 0.714 Vp-p
3) Input Impedance : 75Ω

3-3. Operating Frequency

	Analog	Digital
Horizontal:	28 ~ 80kHz	28 ~ 64kHz
Vertical:	56 ~ 75Hz	60Hz
Dot Clock:	$\leq$ 135MHz	$\leq$ 108MHz

4. Max. Resolution

Analog : 1280 x 1024 / 75Hz
Digital : 1280 x 1024 / 60Hz

5. POWER SUPPLY

5-1. Power: AC 100~240V, 50/60Hz,
5-2. Power Consumption

SDM-E76A/D

Normal operation	< 38W
Active off (deep sleep)	< 1W
Power off	< 1W

SDM-E96A/D

Normal operation	< 44W
Active off (deep sleep)	< 1W
Power off	< 1W

6. ENVIRONMENT

6-1. Operating Temperature:
5°C~35°C (41°F~95°F)
6-2. Relative Humidity:
10%~80% (Non-condensing)

7. DIMENSIONS

SDM-E76A/D
Width: 382 mm (15.1")
Depth: 193.2 mm (7.6")
Height: 403.2 mm (15.9")

SDM-E96A/D
Width: 420 mm (16.6")
Depth: 193.2 mm (7.6")
Height: 433.1 mm (17.1")

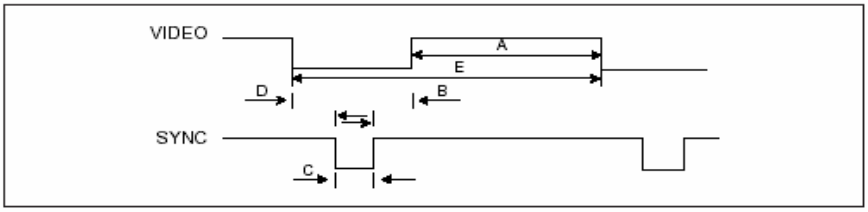
8. WEIGHT

SDM-E76A/D
Net. Weight: 4.5 kg (9.9 lbs)
Gross Weight: 5.6 kg (12.31 lbs)

SDM-E96A/D
Net. Weight : 5.5kg (12.1 lbs)
Gross Weight: 7.2kg (15.9 lbs)

TIMING CHART

TIMING CHART

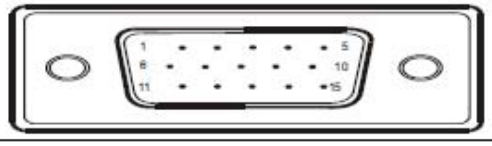


<< Dot Clock (MHz), Horizontal Frequency (kHz), Vertical Frequency (Hz), Horizontal etc... (µs), Vertical etc... (ms) >>

Mode	H/V Sort	Sync Polarity	Dot Clock	Frequency	Total Period (E)	Video Active Time (A)	Blanking time (B)	Sync Duration (D)	Back Porch (F)	Front Porch (C)	Resolution
1	H	-	28.350	31.50 KHz	900	720	180	108	54	18	720 x 400
	V	+		70.156 Hz	449	400	49	3	34	12	
2	H	-	25.175	31.469KHz	800	640	160	96	48	16	640 x 480
	V	-		59.940 Hz	525	480	45	2	33	10	
3	H	-	30.240	35.00 KHz	864	640	224	64	96	64	640 x 480
	V	-		66.667 Hz	525	480	45	3	39	3	
4	H	-	31.500	37.50KHz	840	640	200	64	120	16	640 x 480
	V	-		75.0 Hz	500	480	20	3	16	1	
5	H	-	31.505	35.162 KHz	896	720	176	40	102	34	720 x 480
	V	-		59.901 Hz	587	480	107	2	93	12	
6	H	+-	36.0	35.156 KHz	1024	800	224	72	128	24	800 x 600
	V	+		56.25 Hz	625	600	25	2	22	1	
7	H	+	40.0	37.879 KHz	1056	800	256	128	88	40	800 x 600
	V	+		60.317 Hz	628	600	28	4	23	1	
8	H	+	50.0	48.077 KHz	1040	800	240	120	64	56	800 x 600
	V	+		72.188 Hz	666	600	66	6	23	37	
9	H	+	49.5	46.875 KHz	1056	800	256	80	160	16	800 x 600
	V	+		75.0 Hz	625	600	25	3	21	1	
10	H	-	57.285	49.727 KHz	1152	832	320	64	224	32	832 x 624
	V	-		74.553 Hz	667	624	43	3	37	3	(MAC16")
11	H	-	65	48.363 KHz	1344	1024	320	136	160	24	1024 x 768
	V	-		60.004 Hz	806	768	38	6	29	3	
12	H	-	75	56.476 KHz	1328	1024	304	136	144	24	1024 x 768
	V	-		70.069 Hz	806	768	38	6	29	3	
13	H	+	78.75	60.023 KHz	1312	1024	288	96	176	16	1024 x 768
	V	+		75.029 Hz	800	768	32	3	28	1	
14	H	-	80.00	60.241 KHz	1328	1024	304	96	176	32	1024 x 768
	V	-		74.927 Hz	804	768	36	3	30	3	(MAC 19)
15	H	+	108	67.500 KHz	1600	1152	448	128	256	64	1152 x 864
	V	+		75.000 Hz	900	864	36	3	32	1	
16	H	-	100	68.681 KHz	1456	1152	304	128	144	32	1152 x 870
	V	-		75.062 Hz	915	870	45	3	39	3	(MAC 21)
17	H	-	92.940	61.795 KHz	1504	1152	352	128	194	30	1152 x 900
	V	-		65.950 Hz	937	900	37	4	31	2	
18	H	-	105.590	71.732 KHz	1472	1152	320	96	208	16	1152 x 900
	V	-		76.068 Hz	943	900	43	8	33	2	
19	H	+	46.200	31.216 KHz	1480	1170	310	129	144	37	1170 x 584
	V	+		50.026 Hz	624	584	40	3	34	3	
20	H	+	108.00	60.000 KHz	1800	1280	520	112	312	96	1280 x 960
	V	+		60.000 Hz	1000	960	40	3	36	1	
21	H	+	108.00	63.981 KHz	1688	1280	408	112	248	48	1280 x1024
	V	+		60.020 Hz	1066	1024	42	3	38	1	
22	H	+	135	79.976 KHz	1688	1280	408	144	248	16	1280 x 1024
	V	+		75.025 Hz	1066	1024	42	3	38	1	

SIGNAL CONNECTOR PIN

Analog connectors

NO.	Description	NO.	Description
1.	Red Video	9.	+5V
2.	Green Video	10.	Detect Cable
3.	Blue Video	11.	NC
4.	GND	12.	SDA
5.	Sensor for PC	13.	Horizontal Sync
6.	Red GND	14.	Vertical Sync
7.	Green GND	15.	SCL
8.	Blue GND		
VGA Connector layout			
			

Digital connectors

NO.	Description	NO.	Description
1.	TMDS Data 2-	13.	No Connect
2.	TMDS Data 2+	14.	+5V
3.	TMDS Data 2 Shield	15.	Sense of connection PC
4.	No Connect	16.	Hot Plug Detect
5.	No Connect	17.	TMDS Data 0-
6.	DDC Clock	18.	TMDS Data 0+
7.	DDC Data	19.	TMDS Data 0 Shield
8.	No Connect	20.	No Connect
9.	TMDS Data1-	21.	No Connect
10.	TMDS Data 1+	22.	TMDS Clock Shield
11.	TMDS Data 1 Shield	23.	TMDS Clock +
12.	No Connect	24.	TMDS Clock -
VGA Connector layout			

EDID DATA for E76A/D

EDID data for SDM-E76D (Analog)

No.	Data		No.	Data		No.	Data		No.	Data	
0	00h	<Header>	32	*5	(Blue)Y	64	13h		96	44h	D
1	FFh		33	*5	(White)X	65	00h		97	4Dh	M
2	FFh		34	*5	(White)Y	66	52h		98	2Dh	-
3	FFh		35	ADh	<Established Timings>	67	0Eh		99	45h	E
4	FFh		36	CFh		68	11h		100	37h	7
5	FFh		37	00h		69	00h		101	36h	6
6	FFh		38	81h	<Standard Timings>	70	00h		102	44h	D
7	00h		39	80h	#1:1280*1024/60Hz	71	1Eh		103	0Ah	(EOL)
8	4Dh	< Manufacturer name >	40	81h		72	00h	D Timing #2	104	20h	
9	D9h	SNY	41	40h	#2:1280*960/60Hz	73	00h	<Range>	105	20h	
10	00h	< Product code >	42	01h		74	00h		106	20h	
11	B2h	(00B2) --> B200	43	01h	#3:None	75	FDh		107	20h	
12	01h	(Un-used : Serial)	44	01h		76	00h		108	00h	D Timing #4
13	01h	〃	45	01h	#4:None	77	39h	fV min. 56 [Hz]	109	00h	<Serial Number>
14	01h	〃	46	01h		78	4Bh	fV max. 75 [Hz]	110	00h	<Example>
15	01h	〃	47	01h	#5:None	79	1Ch	fH min. 28 [kHz]	111	FFh	
16	*1	<Week>	48	01h		80	51h	fH max. 81 [kHz]	112	00h	
17	*2	<Year>	49	01h	#6:None	81	0Eh	Max. p_clk 140 [MHz]	113	*3	
18	01h	<EDID S_Version>	50	01h		82	00h		114	*3	
19	03h	<EDID Revision>	51	01h	#7:None	83	0Ah		115	*3	
20	0Eh	<Video Input siganl>	52	01h		84	20h		116	*3	
21	22h	<Max.H. Image Size> 338mm	53	01h	#8:None	85	20h		117	*3	
22	1Bh	<Max.V. Image Size> 270mm	54	30h	D Timing #1	86	20h		118	*3	
23	78h	<Gamma>	55	2Ah	<Signal Timing>	87	20h		119	*3	
24	EAh	<DPMS etc.>	56	00h	(VESA1280x1024@60)	88	20h		120	0Ah	(EOL)
25	*5	<Color>	57	98h		89	20h		121	20h	
26	*5		58	51h		90	00h	D Timing #3	122	20h	
27	*5	(RED)X	59	00h		91	00h	<Model Name 1>	123	20h	
28	*5	(RED)Y	60	2Ah		92	00h	SDM-E76D	124	20h	
29	*5	(Green)X	61	40h		93	FCh		125	20h	
30	*5	(Green)Y	62	30h		94	00h		126	00h	
31	*5	(Blue)X	63	70h		95	53h	S	127	*4	<Check Sum>

EDID data for SDM-E76D (Digital)

No.	Data		No.	Data		No.	Data		No.	Data	
0	00h	<Header>	32	*5	(Blue)Y	64	13h		96	44h	D
1	FFh		33	*5	(White)X	65	00h		97	4Dh	M
2	FFh		34	*5	(White)Y	66	52h		98	2Dh	-
3	FFh		35	A1h	<Established Timings>	67	0Eh		99	45h	E
4	FFh		36	08h		68	11h		100	37h	7
5	FFh		37	00h		69	00h		101	36h	6
6	FFh		38	81h	<Standard Timings>	70	00h		102	44h	D
7	00h		39	80h	#1:1280*1024/60Hz	71	1Eh		103	0Ah	(EOL)
8	4Dh	< Manufacturer name >	40	81h		72	00h	D Timing #2	104	20h	
9	D9h	SNY	41	40h	#2:1280*960/60Hz	73	00h	<Range>	105	20h	
10	00h	< Product code >	42	01h		74	00h		106	20h	
11	B3h	(00B3) --> B300	43	01h	#3:None	75	FDh		107	20h	
12	01h	(Un-used : Serial)	44	01h		76	00h		108	00h	D Timing #4
13	01h	〃	45	01h	#4:None	77	39h	fV min. 57 [Hz]	109	00h	<Serial Number>
14	01h	〃	46	01h		78	3Fh	fV max. 63 [Hz]	110	00h	<Example>
15	01h	〃	47	01h	#5:None	79	1Ch	fH min. 28 [kHz]	111	FFh	
16	*1	<Week>	48	01h		80	41h	fH max. 65 [kHz]	112	00h	
17	*2	<Year>	49	01h	#6:None	81	0Bh	Max. p_clk 110 [MHz]	113	*3	
18	01h	<EDID S_Version>	50	01h		82	00h		114	*3	
19	03h	<EDID Revision>	51	01h	#7:None	83	0Ah		115	*3	
20	80h	<Video Input siganl>	52	01h		84	20h		116	*3	
21	22h	<Max.H. Image Size>	53	01h	#8:None	85	20h		117	*3	
22	1Bh	<Max.V. Image Size>	54	30h	D Timing #1	86	20h		118	*3	
23	78h	<Gamma>	55	2Ah	<Signal Timing>	87	20h		119	*3	
24	EAh	<DPMS etc.>	56	00h	(VESA1280x1024@60)	88	20h		120	0Ah	(EOL)
25	*5	<Color>	57	98h		89	20h		121	20h	
26	*5		58	51h		90	00h	D Timing #3	122	20h	
27	*5	(RED)X	59	00h		91	00h	<Model Name 1>	123	20h	
28	*5	(RED)Y	60	2Ah		92	00h	SDM-E76D	124	20h	
29	*5	(Green)X	61	40h		93	FCh		125	20h	
30	*5	(Green)Y	62	30h		94	00h		126	00h	
31	*5	(Blue)X	63	70h		95	53h	S	127	*4	<Check Sum>

EDID data for SDM-E76A (Analog)

No.	Data		No.	Data		No.	Data		No.	Data	
0	00h	<Header>	32	*5	(Blue)Y	64	13h		96	44h	D
1	FFh		33	*5	(White)X	65	00h		97	4Dh	M
2	FFh		34	*5	(White)Y	66	52h		98	2Dh	-
3	FFh		35	ADh	<Established Timings>	67	0Eh		99	45h	E
4	FFh		36	CFh		68	11h		100	37h	7
5	FFh		37	00h		69	00h		101	36h	6
6	FFh		38	81h	<Standard Timings>	70	00h		102	41h	A
7	00h		39	80h	#1:1280*1024/60Hz	71	1Eh		103	0Ah	(EOL)
8	4Dh	< Manufacturer name >	40	81h		72	00h	D Timing #2	104	20h	
9	D9h	SNY	41	40h	#2:1280*960/60Hz	73	00h	<Range>	105	20h	
10	00h	< Product code >	42	01h		74	00h		106	20h	
11	B0h	(00B0) --> B000	43	01h	#3:None	75	FDh		107	20h	
12	01h	(Un-used : Serial)	44	01h		76	00h		108	00h	D Timing #4
13	01h	〃	45	01h	#4:None	77	38h	fV min. 56 [Hz]	109	00h	<Serial Number>
14	01h	〃	46	01h		78	4Bh	fV max. 75 [Hz]	110	00h	<Example>
15	01h	〃	47	01h	#5:None	79	1Ch	fH min. 28 [kHz]	111	FFh	
16	*1	<Week>	48	01h		80	51h	fH max. 81 [kHz]	112	00h	
17	*2	<Year>	49	01h	#6:None	81	0Eh	Max. p_clk 140 [MHz]	113	*3	
18	01h	<EDID S.Version>	50	01h		82	00h		114	*3	
19	03h	<EDID Revision>	51	01h	#7:None	83	0Ah		115	*3	
20	0Eh	<Video Input siganl>	52	01h		84	20h		116	*3	
21	22h	<Max.H. Image Size>	53	01h	#8:None	85	20h		117	*3	
22	1Bh	<Max.V. Image Size>	54	30h	D Timing #1	86	20h		118	*3	
23	78h	<Gamma>	55	2Ah	<Signal Timing>	87	20h		119	*3	
24	EAh	<DPMS etc.>	56	00h	(VESA1280x1024@60)	88	20h		120	0Ah	(EOL)
25	*5	<Color>	57	98h		89	20h		121	20h	
26	*5		58	51h		90	00h	D Timing #3	122	20h	
27	*5	(RED)X	59	00h		91	00h	<Model Name 1>	123	20h	
28	*5	(RED)Y	60	2Ah		92	00h	SDM-E76A	124	20h	
29	*5	(Green)X	61	40h		93	FCh		125	20h	
30	*5	(Green)Y	62	30h		94	00h		126	00h	
31	*5	(Blue)X	63	70h		95	53h	S	127	*4	<Check Sum>

*1 Input Data according to production week.
*2 Input Data according to production year.
Year code = A.D.-1990
Ex.) A.D.2005-> 0Fh
*3 Change decimal-seven-digit serial number to the ACII code and input it by unit.
Ex.) 5000001-> 35, 30, 30, 30, 30, 30, 31
113 -> 35h
114 -> 30h 117 -> 30h
115 -> 30h 118 -> 30h
116 -> 30h 119 -> 31h
*4 Input the data as the value of the lower 8 bits of the sum up all registers from #0 to #126 is equal to "00h".
ex) The sum of data from #0 to #126 is "1C2Bh".
In this case, the check sum is "D5h"
, 2Bh+D5h=100h

*5 Color Data of panel (This is not final data)

CPT panel (CLAA170EA07Q)			CMO panel (M170E5-L09)					
25	E0h	<Color>	25	0Ch	<Color>	25		<Color>
26	E5h		26	75h		26		
27	A4h	(RED)X=0.644	27	A5h	(RED)X=0.645	27		(RED)X=
28	56h	(RED)Y=0.338	28	59h	(RED)Y=0.348	28		(RED)Y=
29	45h	(Green)X=0.270	29	47h	(Green)X=0.280	29		(Green)X=
30	9Ah	(Green)Y=0.602	30	9Bh	(Green)Y=0.605	30		(Green)Y=
31	23h	(Blue)X=0.140	31	24h	(Blue)X=0.142	31		(Blue)X=
32	15h	(Blue)Y=0.084	32	11h	(Blue)Y=0.069	32		(Blue)Y=
33	50h	(White)X=0.313	33	50h	(White)X=0.313	33		(White)X=
34	54h	(White)Y=0.329	34	54h	(White)Y=0.329	34		(White)Y=

EDID DATA for E96A/D

EDID data for SDM-E96D (Analog)

No.	Data		No.	Data		No.	Data		No.	Data	
0	00h	<Header>	32	*5	(Blue)Y	64	13h		96	44h	D
1	FFh		33	*5	(White)X	65	00h		97	4Dh	M
2	FFh		34	*5	(White)Y	66	78h		98	2Dh	-
3	FFh		35	ADh	<Established Timings>	67	2Dh		99	45h	E
4	FFh		36	CFh		68	11h		100	39h	9
5	FFh		37	00h		69	00h		101	36h	6
6	FFh		38	81h	<Standard Timings>	70	00h		102	44h	D
7	00h		39	80h	#1:1280*1024/60Hz	71	1Eh		103	0Ah	(EOL)
8	4Dh	< Manufacturer name >	40	81h		72	00h	D Timing #2	104	20h	
9	D9h	SNY	41	40h	#2:1280*960/60Hz	73	00h	<Range>	105	20h	
10	00h	< Product code >	42	01h		74	00h		106	20h	
11	B4h	(00B4) --> B400	43	01h	#3:None	75	FDh		107	20h	
12	01h	(Un-used : Serial)	44	01h		76	00h		108	00h	D Timing #4
13	01h	〃	45	01h	#4:None	77	38H	fV min. 56 [Hz]	109	00h	<Serial Number>
14	01h	〃	46	01h		78	4Bh	fV max. 75 [Hz]	110	00h	<Example>
15	01h	〃	47	01h	#5:None	79	1Ch	fH min. 28 [kHz]	111	FFh	
16	*1	<Week>	48	01h		80	51h	fH max. 81 [kHz]	112	00h	
17	*2	<Year>	49	01h	#6:None	81	0Eh	Max. p_clk 140 [MHz]	113	*3	
18	01h	<EDID S_Version>	50	01h		82	00h		114	*3	
19	03h	<EDID Revision>	51	01h	#7:None	83	0Ah		115	*3	
20	0Eh	<Video Input siganl>	52	01h		84	20h		116	*3	
21	26h	<Max.H. Image Size> 376mm	53	01h	#8:None	85	20h		117	*3	
22	1Eh	<Max.V. Image Size> 301mm	54	30h	D Timing #1	86	20h		118	*3	
23	78h	<Gamma>	55	2Ah	<Signal Timing>	87	20h		119	*3	
24	EAh	<DPMS etc.>	56	00h	(VESA1280x1024@60)	88	20h		120	0Ah	(EOL)
25	*5	<Color>	57	98h		89	20h		121	20h	
26	*5		58	51h		90	00h	D Timing #3	122	20h	
27	*5	(RED)X	59	00h		91	00h	<Model Name 1>	123	20h	
28	*5	(RED)Y	60	2Ah		92	00h	SDM-E96D	124	20h	
29	*5	(Green)X	61	40h		93	FCh		125	20h	
30	*5	(Green)Y	62	30h		94	00h		126	00h	
31	*5	(Blue)X	63	70h		95	53h	S	127	*4	<Check Sum>

EDID data for SDM-E96D (Digital)

No.	Data		No.	Data		No.	Data		No.	Data	
0	00h	<Header>	32	*5	(Blue)Y	64	13h		96	44h	D
1	FFh		33	*5	(White)X	65	00h		97	4Dh	M
2	FFh		34	*5	(White)Y	66	78h		98	2Dh	-
3	FFh		35	A1h	<Established Timings>	67	2Dh		99	45h	E
4	FFh		36	08h		68	11h		100	39h	9
5	FFh		37	00h		69	00h		101	36h	6
6	FFh		38	81h	<Standard Timings>	70	00h		102	44h	D
7	00h		39	80h	#1:1280*1024/60Hz	71	1Eh		103	0Ah	(EOL)
8	4Dh	< Manufacturer name >	40	81h		72	00h	D Timing #2	104	20h	
9	D9h	SNY	41	40h	#2:1280*960/60Hz	73	00h	<Range>	105	20h	
10	00h	< Product code >	42	01h		74	00h		106	20h	
11	B5h	(00B5) --> B500	43	01h	#3:None	75	FDh		107	20h	
12	01h	(Un-used : Serial)	44	01h		76	00h		108	00h	D Timing #4
13	01h	〃	45	01h	#4:None	77	39h	fV min. 57 [Hz]	109	00h	<Serial Number>
14	01h	〃	46	01h		78	3Fh	fV max. 63 [Hz]	110	00h	<Example>
15	01h	〃	47	01h	#5:None	79	1Ch	fH min. 28 [kHz]	111	FFh	
16	*1	<Week>	48	01h		80	41h	fH max. 65 [kHz]	112	00h	
17	*2	<Year>	49	01h	#6:None	81	0Bh	Max. p_clk 110 [MHz]	113	*3	
18	01h	<EDID S_Version>	50	01h		82	00h		114	*3	
19	03h	<EDID Revision>	51	01h	#7:None	83	0Ah		115	*3	
20	80h	<Video Input siganl>	52	01h		84	20h		116	*3	
21	26h	<Max.H. Image Size>	53	01h	#8:None	85	20h		117	*3	
22	1Eh	<Max.V. Image Size>	54	30h	D Timing #1	86	20h		118	*3	
23	78h	<Gamma>	55	2Ah	<Signal Timing>	87	20h		119	*3	
24	EAh	<DPMS etc.>	56	00h	(VESA1280x1024@60)	88	20h		120	0Ah	(EOL)
25	*5	<Color>	57	98h		89	20h		121	20h	
26	*5		58	51h		90	00h	D Timing #3	122	20h	
27	*5	(RED)X	59	00h		91	00h	<Model Name 1>	123	20h	
28	*5	(RED)Y	60	2Ah		92	00h	SDM-E96D	124	20h	
29	*5	(Green)X	61	40h		93	FCh		125	20h	
30	*5	(Green)Y	62	30h		94	00h		126	00h	
31	*5	(Blue)X	63	70h		95	53h	S	127	*4	<Check Sum>

EDID data for SDM-E96A (Analog)

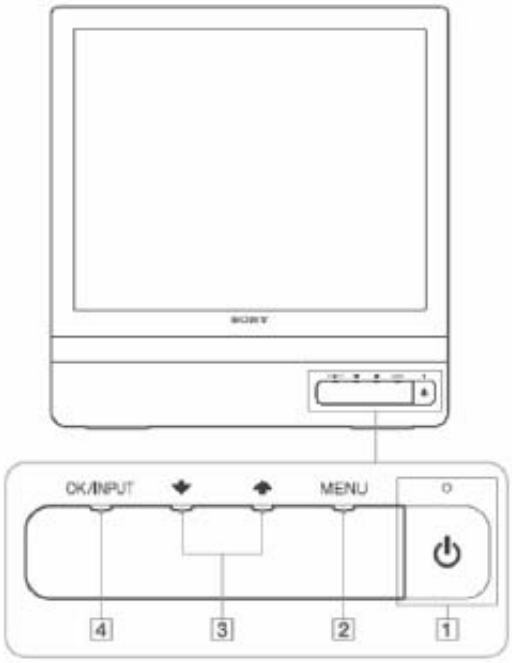
No.	Data		No.	Data		No.	Data		No.	Data	
0	00h	<Header>	32	*5	(Blue)Y	64	13h		96	44h	D
1	FFh		33	*5	(White)X	65	00h		97	4Dh	M
2	FFh		34	*5	(White)Y	66	78h		98	2Dh	-
3	FFh		35	ADh	<Established Timings>	67	2Dh		99	45h	E
4	FFh		36	CFh		68	11h		100	39h	9
5	FFh		37	00h		69	00h		101	36h	6
6	FFh		38	81h	<Standard Timings>	70	00h		102	41h	A
7	00h		39	80h	#1:1280*1024/60Hz	71	1Eh		103	0Ah	(EOL)
8	4Dh	< Manufacturer name >	40	81h		72	00h	D Timing #2	104	20h	
9	D9h	SNY	41	40h	#2:1280*960/60Hz	73	00h	<Range>	105	20h	
10	00h	< Product code >	42	01h		74	00h		106	20h	
11	B1h	(00B1) --> B100	43	01h	#3:None	75	FDh		107	20h	
12	01h	(Un-used : Serial)	44	01h		76	00h		108	00h	D Timing #4
13	01h	〃	45	01h	#4:None	77	38h	fV min. 56 [Hz]	109	00h	<Serial Number>
14	01h	〃	46	01h		78	4Bh	fV max. 75 [Hz]	110	00h	<Example>
15	01h	〃	47	01h	#5:None	79	1Ch	fH min. 28 [kHz]	111	FFh	
16	*1	<Week>	48	01h		80	51h	fH max. 81 [kHz]	112	00h	
17	*2	<Year>	49	01h	#6:None	81	0Eh	Max. p_clk 140 [MHz]	113	*3	
18	01h	<EDID S_Version>	50	01h		82	00h		114	*3	
19	03h	<EDID Revision>	51	01h	#7:None	83	0Ah		115	*3	
20	0Eh	<Video Input siganl>	52	01h		84	20h		116	*3	
21	26h	<Max.H. Image Size> 376mm	53	01h	#8:None	85	20h		117	*3	
22	1Eh	<Max.V. Image Size> 301mm	54	30h	D Timing #1	86	20h		118	*3	
23	78h	<Gamma>	55	2Ah	<Signal Timing>	87	20h		119	*3	
24	EAh	<DPMS etc.>	56	00h	(VESA1280x1024@60)	88	20h		120	0Ah	(EOL)
25	*5	<Color>	57	98h		89	20h		121	20h	
26	*5		58	51h		90	00h	D Timing #3	122	20h	
27	*5	(RED)X	59	00h		91	00h	<Model Name 1>	123	20h	
28	*5	(RED)Y	60	2Ah		92	00h	SDM-E96A	124	20h	
29	*5	(Green)X	61	40h		93	FCh		125	20h	
30	*5	(Green)Y	62	30h		94	00h		126	00h	
31	*5	(Blue)X	63	70h		95	53h	S	127	*4	<Check Sum>

*1 Input Data according to production week.
*2 Input Data according to production year.
Year code = A.D.-1990
Ex.) A.D.2005-> 0Fh
*3 Change decimal-seven-digit serial number to the ACII code and input it by unit.
Ex.) 5000001-> 35, 30, 30, 30, 30, 30, 31
113 -> 35h
114 -> 30h 117 -> 30h
115 -> 30h 118 -> 30h
116 -> 30h 119 -> 31h
*4 Input the data as the value of the lower 8 bits of the sum up all registers from #0 to #126 is equal to "00h".
ex) The sum of data from #0 to #126 is "1C2Bh".
In this case, the check sum is "D5h"
, 2Bh+D5h=100h
*5 Color Data of panel (This is not final data)

Hannstar panel(HSD190ME13-A10)			AUO panel(M190EN04 V5)		
25	C5h	<Color>	25	68h	<Color>
26	56h		26	75h	
27	A4h	(RED)X=0.644	27	A2h	(RED)X=0.634
28	54h	(RED)Y=0.328	28	5Ah	(RED)Y=0.354
29	4Ah	(Green)X=0.290	29	49h	(Green)X=0.287
30	9Dh	(Green)Y=0.614	30	9Fh	(Green)Y=0.621
31	24h	(Blue)X=0.142	31	23h	(Blue)X=0.138
32	14h	(Blue)Y=0.079	32	13h	(Blue)Y=0.077
33	4Fh	(White)X=0.310	33	50h	(White)X=0.313
34	54h	(White)Y=0.330	34	54h	(White)Y=0.329

OPERATING INSTRUCTIONS

<Key Control>



1 Power Switch and Indicator:

To turn the display On or Off, press the Power Switch. The power indicator lights up in green when the display Is turned on, and lights up in orange when the monitor Is in power saving mode.

2 Menu Button:

This button displays or close the main menu.

3 ↓/↑ Button:

These buttons are used to select the menu items make adjustments.

4 OK Button:

This button selects the item or executes the settings in the menu.

<Common Adjustment>

NO	Icon	Tag	Description
1		Backlight	Adjust the brightness of the backlight
2		Contrast	Adjust the picture contrast
3		Brightness	Adjust the picture brightness (black level)
4		Screen	Adjust the picture's sharpness or its centering
5		Color	Adjust the color temperature of the picture
6	γ	Gamma	Change the picture's color shade settings
7		Sharpness	Adjust to sharpen the edge of images
8		Menu position	Change the on screen menu position
9		Input Sensing	Automatically detects an input signal to an input terminal, and changes the input automatically before the monitor goes into the power saving mode.
9		Language	Chance the language used on menus or messages
10		Reset	Reset the adjustments to the default settings
11		Menu lock	Lock the control of buttons to prevent accidental adjustments or resetting

SERVICE MODE

To enter service OSD menu,

1) Turn off the power switch button.
2) Press “Down” key, and power key simultaneity.
3) Shows the service OSD menu. That menu is located in down side of main menu.
4) The service OSD menu contains additional menus as described below.

Service Mode Explanations

「COLOR TEMP」

Adjust R/G/B color values of contrast and brightness in 9300k, 6500k, Use color mode.
(Factory Setting Area).

「INITIAL EEPROM」

Initialize the EDID DATA at DDC2B EEPROM is saved system memory.
COLOR TEMP data becomes the default “128”. User table data is reset.

「CLR. ETI」

ETI (the used time of MNT) counter shall be reset to 0H by activating this function.

「AGING」

Enable to set the monitor in the Aging mode or exit from the mode. Select aging mode (On/Off)

「WHITE BALANCE」

Adjust the offset voltage and gain value in Analog RGB by AUTO.

「DEFAULT TIMING」

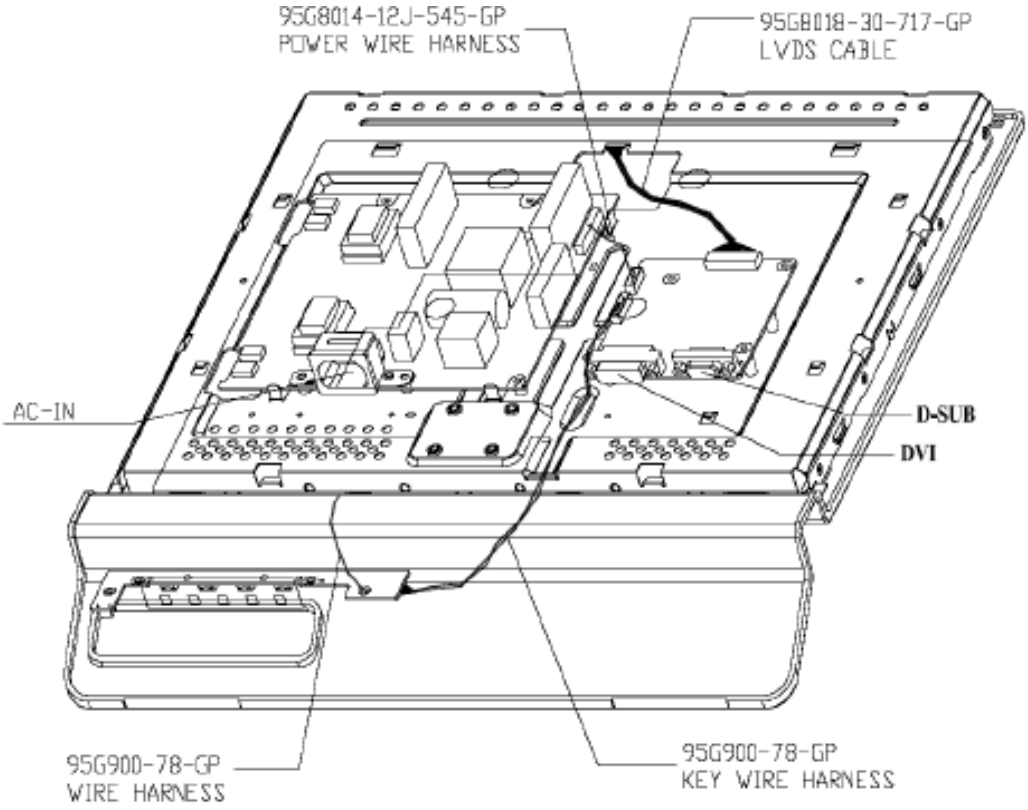
Select the resolution timing of the signal. Menu is 1152×864(VESA standard timing) or 1152×870(MAC computer timing). Default is 1152×870.

「MODULE」

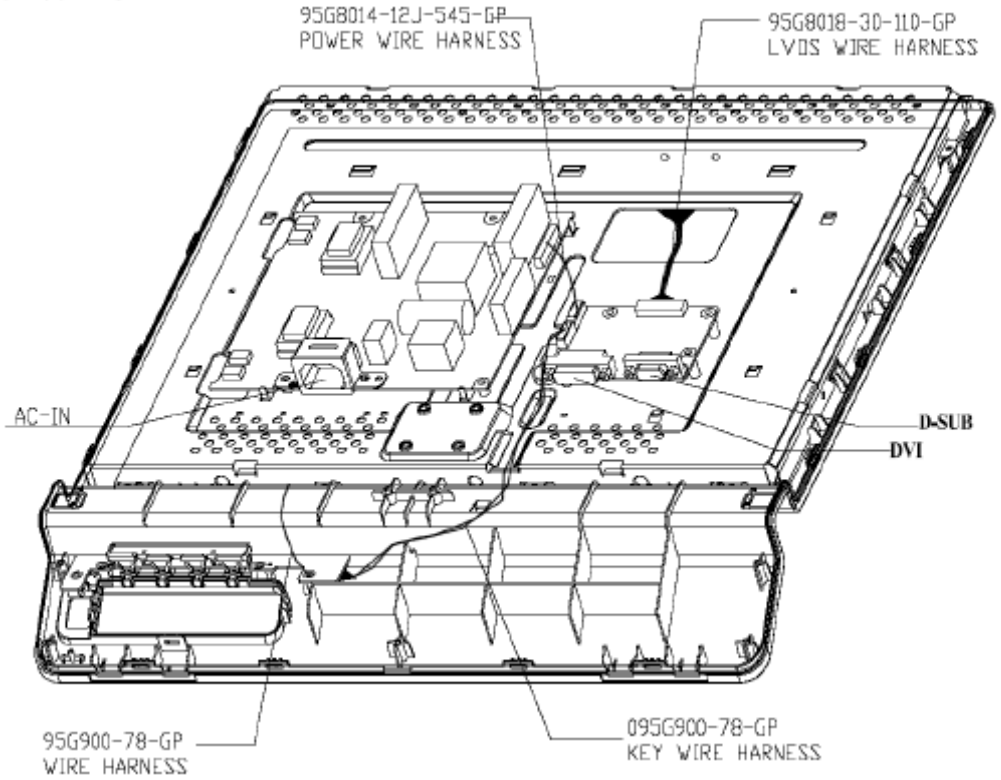
To select applied module
When you replace A board or Panel, it is required to set the Panel inch size and the Panel maker name on selecting “MODULE”.

WIRING DIAGRAM

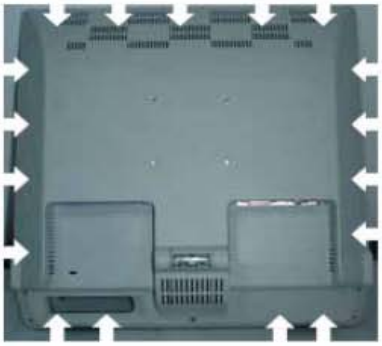
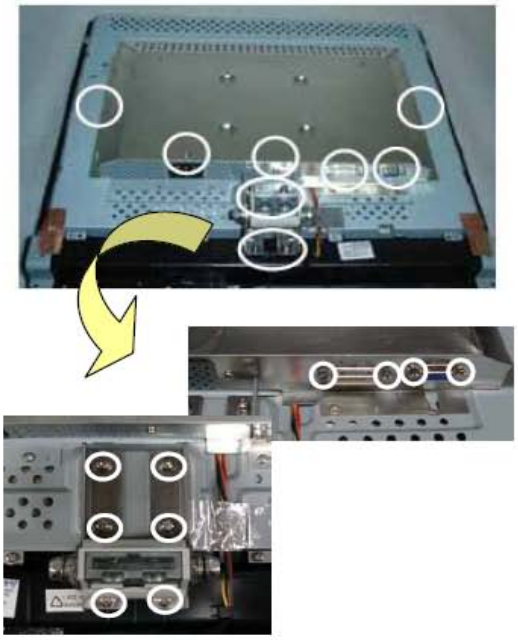
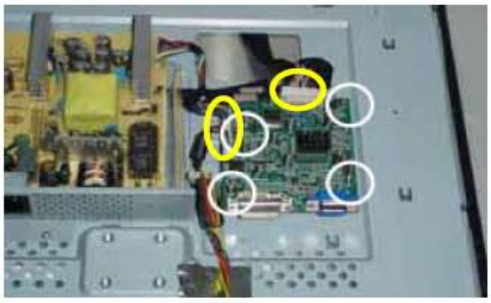
E76 Wire

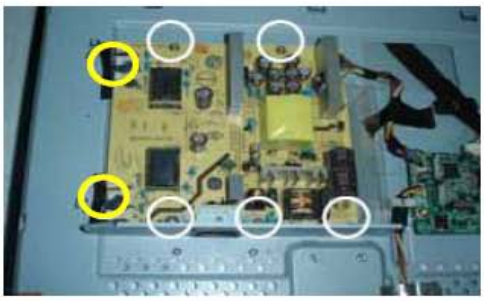
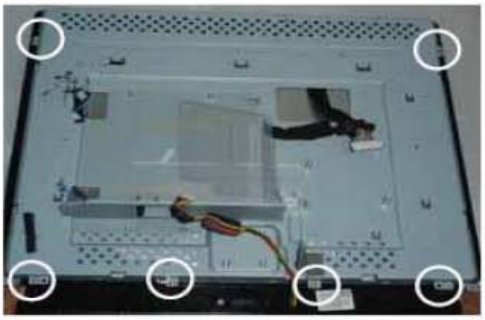


E96 Wire



DISASSEMBLY PROCESS

Step	Figure	Description
Remove the screw on the Hinge and Rear cove		Put the monitor on a clear soft cloth with panel facing to the table, and then remove the 7 screws.
Remove the rear cover		Pay attention to the hooks marked by arrowheads, and then open it with a thin card or spatula till the bezel and rear cover separated.
Remove the shield		Remove the 15 screws, then remove the shield. (Hinge x 6ea, Shield x 5ea, DVI & HD15 hexagonal screw x 4ea)
Take apart the Main board		Remove the 4 screws in the Main board and disconnect the 3 interfaces.

Step	Figure	Description
Take apart the Power board		Remove the 5 screws on the Power board and disconnect the 4 interfaces.
Take apart the key board		Remove the 8 screws on Key board and L&R bracket.
Remove the bezel		Remove the 6 screws on the main frame.
		Pay attention to the hooks marked by arrowheads.
The panel		Only Panel with main frame.

ADJUSTMENT

1. Procedures of how to go to service mode.

1) Enter the service mode of this unit by turning on the power while pressing “down” key and the "power" key simultaneously.
2) Press "MENU" key----MAINTAIN.
3) Press the “Down” or “Up” key to select the icon “S” and press "OK" key to enter into the service menu.
4) Select the desired function.
5) Press the "MENU" key to exit OSD.
6) Turn off the power and then turn on it again. The monitor then enters the normal mode.
   To enter the service again, repeat the procedure described above.

Note

W/B readjustment is required after the panel, board and microcomputer are replaced. However, be sure to perform aging for more than 30 minutes for RGB reset before W/B adjustment.

2. Setup

1) Prepare timing and pattern data for a signal generator according to the Sony timing specifications.
2) Connect a monitor video cable to the signal generator.
3) Put Color Analyzer (ex. CA-210) 50cm away from the monitor, specify it vertically in the center of the display, and adjust the focus to the optimum level using an eyepiece.
4) Put the monitor and Color Analyzer (ex. CA-210) in a light-shielded room.
5) Set up [SERVICE MODE] of the monitor.

3. Operation

Data is manually set to improve the productivity. The brightness, contrast, and backlight are set to 50, 90 and 100 respectively. After that, the default data of the color temperature to be adjusted is set.

4. Warm up time

Warm up for 30 minutes before performing any adjustment.

5. Adjustment for White Balance

a. Display five white block and black pattern VGA/ 60Hz (Input level 0.73V).
b. Set up [SERVICE MODE].
c. Click “INITIAL EEPROM” and again setup Service Mode.
d. Click "WHITE BALANCE" and then select “AUTO”.
e. Prepare timing and full white pattern.

6. 9300K color adjustment

a. Select "9300K" in "COLOR TEMP" and enter.
b. Use a 100% (255Gray) IRE white video field in the primary (SXGA) mode.
c. Adjust "SUB CONTRAST" to secure the color temperature
d. Press "MENU" key to exit adjust mode.

7. 6500K color adjustment

a. Select "6500K" in "COLOR TEMP" and enter.
b. Repeat the adjustment procedure as steps b to d at 9300K.

8. SRGB color adjustment

a. Select "SRGB" in "COLOR TEMP" and enter.
b. Adjust “SUB CONTRAST” value to the value of 6500K RGB.

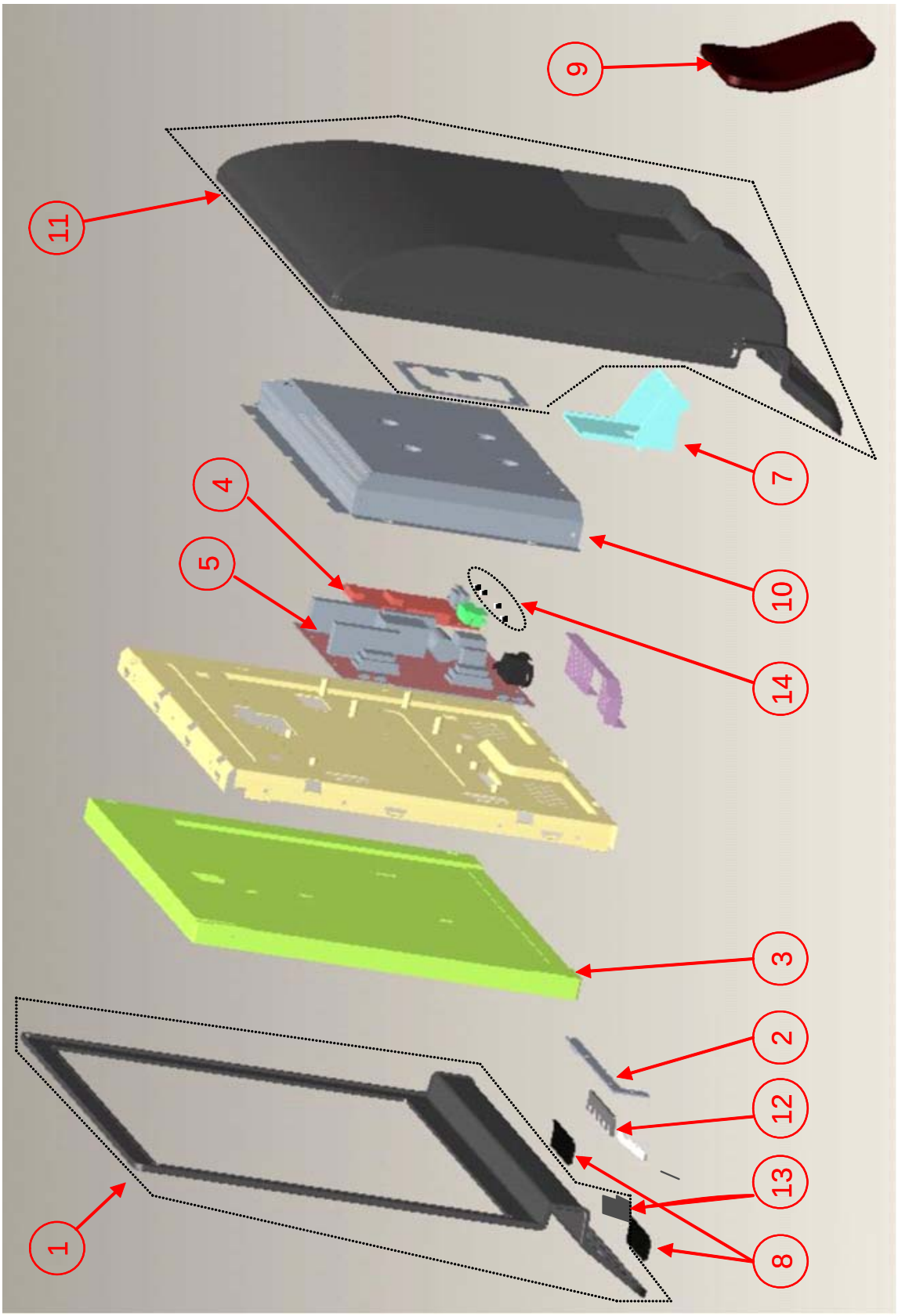
<<Specification of WB adjustment>>

Panel	Mode	100IRE		
		x (+/−15)	y (+/−15)	Y (+40/−30)
Hannstar	9300K	280	292	190
	6500K	308	326	210
	sRGB	308	326	180
AUO	9300K	277	291	190
	6500K	306	324	210
	sRGB	306	324	180
CPT	9300K	279	298	190
	6500K	312	317	210
	sRGB	312	317	180
CMO	9300K	280	286	190
	6500K	309	323	210
	sRGB	309	323	180

SERIAL NUMBER LIST

Model name	Colour	Destination	Serial Range	Panel	Factory
SDM-E76A	BLACK	AEP	1,600,001-1,700,000	CPT	TPV
			1,700,001-1,800,000	CMO	
SDM-E76D			1,600,001-1,700,000	CPT	
			1,700,001-1,800,000	CMO	
SDM-E96A			1,500,001-1,600,000	AUO	
			1,900,001-2,000,000	Hannstar	
SDM-E96D			1,500,001-1,600,000	AUO	
			1,900,001-2,000,000	Hannstar	
SDM-E76A		USA	1,600,001-1,700,000	CPT	
			1,700,001-1,800,000	CMO	
SDM-E76D			1,600,001-1,700,000	CPT	
			1,700,001-1,800,000	CMO	
SDM-E96A			1,500,001-1,600,000	AUO	
			1,900,001-2,000,000	Hannstar	
SDM-E96D			1,500,001-1,600,000	AUO	
			1,900,001-2,000,000	Hannstar	
SDM-E76D		TAIWAN	1,600,001-1,700,000	CPT	
			1,700,001-1,800,000	CMO	
SDM-E96D			1,500,001-1,600,000	AUO	
			1,900,001-2,000,000	Hannstar	
SDM-E76A		CHINA	1,600,001-1,700,000	CPT	
			1,700,001-1,800,000	CMO	
SDM-E76D			1,600,001-1,700,000	CPT	
			1,700,001-1,800,000	CMO	
SDM-E96A			1,500,001-1,600,000	AUO	
			1,900,001-2,000,000	Hannstar	
SDM-E96D			1,500,001-1,600,000	AUO	
			1,900,001-2,000,000	Hannstar	

EXPLODED VIEW



REPLACEMENT PARTS LIST

SDM-E76A/D

Ref. No.	SONY Part No.	SONY name
1	X21099921	BEZEL ASSY (E76D)
	X21480871	BEZEL ASSY (E76A)
2	178959421	Mounted PWB, H (Key board for E76A)
	178959411	Mounted PWB, H (Key board for E76D)
3	180216611	Panel: CLAA170EA07Q (CPT)
	180216711	Panel: M170E5-L09 (CMO)
4	178959011	Mounted PWB, A (Main board) (E76D for CPT)
	178959111	Mounted PWB, A (Main board) (E76A for CPT)
	178959021	Mounted PWB, A (Main board) (E76D for CMO)
	178959121	Mounted PWB, A (Main board) (E76A for CMO)
5	178959211	Mounted PWB, G (Power board) (for CPT)
	178958811	Mounted PWB, G (Power board) (for CMO)
6	191002683	Connector Assy (Panle link cable)
7	X21099941	HINGE ASSY
8	268576501	Rubber, Front Foot **(Only 1 piece)**
9	268576601	STAND
10	268576901	SHIELD, REAR (E76D)
	268576911	SHIELD, REAR (E76A)
11	268575901	CABINET, REAR
12	268576101	MULTI BUTTON
13	268576201	FRONT POWER BUTTON
14	269348001	HEXAGON SCREW **(Only 1 piece)**
ACCESSORIES & PACKING MATERIALS		
15	182984911	POWER CORD, BLACK (AEP)
	182984811	POWER CORD, BLACK (U/C)
	183086221	POWER CORD, BLACK (WB)
	183344411	POWER CORD, BLACK (CH)
16	182985511	DVI CABLE
17	182987611	D-SUB CABLE
18	268147621	QUICK SETUP GUIDE (AEP)
	268147611	QUICK SETUP GUIDE (U/C,WB)
19	268595601	CD-ROM

※Please refer to the following URL of TV QA web page to see the latest service parts list.
http://www.tvdg.sony.co.jp/cs/sdm-pn/index.html

SDM-E96A/D

Ref. No.	SONY Part No.	SONY name
1	X21099931	BEZEL ASSY (E96D)
	X21480881	BEZEL ASSY (E96A)
2	178959421	Mounted PWB, H (Key board for E96A)
	178959411	Mounted PWB, H (Key board for E96D)
3	180216511	Panel: M190EG04V5 (AUO)
	180216411	Panel: HSD190ME13-A10 (HANNSTAR)
4	178959031	Mounted PWB, A (Main board) (E96D for HannStar)
	178959131	Mounted PWB, A (Main board) (E96A for HannStar)
	178959041	Mounted PWB, A (Main board) (E96D for AUO)
	178959141	Mounted PWB, A (Main board) (E96A for AUO)
5	178959311	Mounted PWB, G (Power board) (for AUO)
	178958911	Mounted PWB, G (Power board) (for HANNSTAR)
6	191002852	Connector Assy (Panel Link Cable)
7	X21099951	HINGE ASSY
8	268576501	Rubber, Front Foot **(Only 1 piece)**
9	268576601	STAND
10	268576901	SHIELD, REAR (E96D)
	268576911	SHIELD, REAR (E96A)
11	268576001	CABINET, REAR
12	268576101	MULTI BUTTON
13	268576201	FRONT POWER BUTTON
14	269348001	HEXAGON SCREW **(Only 1 piece)**
ACCESSORIES & PACKING MATERIALS		
15	182984911	POWER CORD, BLACK (AEP)
	182984811	POWER CORD, BLACK (U/C)
	183086221	POWER CORD, BLACK (WB)
	183344411	POWER CORD, BLACK (CH)
16	182985511	DVI CABLE
17	182987611	D-SUB CABLE
18	268147621	QUICK SETUP GUIDE (AEP)
	268147611	QUICK SETUP GUIDE (U/C,WB)
19	268595601	CD-ROM

※Please refer to the following URL of TV QA web page to see the latest service parts list.
http://www.tvdg.sony.co.jp/cs/sdm-pn/index.html